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ABSTRACT

This study explored the relevance of funding equality on student performance in a large, urban Kentucky county. Data were collected from the district annual report on elementary schools, the Kentucky State Data Center (socioeconomic information), and the county planning commission (geographical information). Data analyses identified the best predictors among a group of potential variables affecting student achievement as measured by the Comprehensive Test of Basic Skills. It also assessed the differences of schools' geographic location in terms of student achievement. Results indicated that students' socioeconomic status was a more accurate predictor of educational outcomes than level of spending. The percentage of students receiving free lunch was the best predictor of student academic scores, followed by percentage of black students and economic status of the region surrounding the school. Average household income correlated to language scores, and household income and percentage of black students correlated to mathematics scores. Findings suggested that funding equalization by itself might not alter a bimodal pattern of educational performance, with some schools serving high achievers while others perpetuate low achievement. Non-school variables must be addressed in order for educational reforms to have an impact on student achievement among lower-income groups. (Contains 35 references.) (SM)

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Running Head: EDUCATIONAL EQUITY IN A REFORM ENVIRONMENT

# Educational Equity in a Reform Environment: The Effect of Socio-Economic Status on Student Achievement

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Post hoc procedures were utilized to find the specific group differences among the four groups on reading, language, and mathematics. The Tukey Honestly Significant Difference Test showed that the elementary schools located in East have a statistically significant difference on average reading, language, and mathematics scores when compared with the elementary schools located in the West of the county at the .05 level (Mean Difference = 8.28, 9.68, and 9.37, respectively). Also, a statistically significant difference was found between the language and mathematics achievement scores of schools located in the East and Southwest area of the county at the .05 level (Mean Difference = 7.32 and 7.51, respectively).

## Discussion

An assumption behind many reform efforts is that increasing the availability of funds allows schools to obtain resources to meet the academic needs for all students. In order to assess the factors related to student achievement, this study explored the influence of amount of money spent per pupil in a county of Kentucky. Funding was not found to be a predictor of student achievement as defined by CTBS scores. This suggests that the concept of adequacy is not well defined by funding and that more needs to be done to lower the achievement gap between different societal groups or geographic areas.

The results of the regression analyses support previous research that students' socioeconomic status is a good predictor of achievement in schools. The study found that the percentage of students on free lunch is the best predictor of student achievement scores, followed by the percentage of black student and the economic status of the region surrounding the school. These three variables contribute to 82% of the variability in score. Furthermore, data analysis



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Abstract

American educational reform movements have focused some attention on the issue of finance and funding equity. The Kentucky Educational Reform Act (KERA) mandated a complete restructuring of the public elementary and secondary system in the area of finance, governance, curriculum, and assessment. The purpose of this paper is to explore the relevance of funding equality on student performance in a large urban county in the state of Kentucky. Data were collected from three sources: the district annual report on elementary schools (N =88), the Kentucky State Data Center that provided socioeconomic information, and the county planning commission that facilitated geographic information. Univariate and multivariate regression analyses were performed to identify the best predictors among a group of potential variables affecting student achievement as measured by the Comprehensive Test of Basic Skills (CTBS). Also, univariate and multivariate analysis of variance (ANOVA and MANOVA, respectively) were used to assess the differences of schools' geographic location in terms of student achievement. Previous research suggesting that students' socio-economic status is a better predictor of educational outcomes than level of spending was supported. Household income and the percentage of Black students also collaborated at a lower level in the prediction model. More precise influences of socioeconomic status and geographic location on specific subject areas of the CTBS (i.e., reading, language, and writing) were found with the help of multivariate techniques. Findings indicated that funding equalization by itself might not alter a bimodal pattern of educational performance with some schools serving high achievers while other schools perpetuating low achievement. Non-school variables have to be addressed if we expect that educational reforms will have an impact on student achievement by lower-income groups. Implications for policy and administrative practice are discussed.

# Educational Equity in a Reform Environment: The Effect of Socio-Economic Status on Student Achievement

The inequitable distribution of public school funding has charged a reform movement that has swept the nation through the last four decades. Major goals of most educational reform movements include issues related to equity and adequacy. Equity refers to the attempt to balance the unequal allocation of educational resources and, to therefore balance educational progress. One assumes that all students can learn when provided with the opportunity, time and resources to do so. Adequacy refers to the expected level of achievement of all students.

Adequacy can be explored by examining the achievement of all students across a district. Many urban districts have been accused of creating "islands of quality education" to serve more affluent and high achievement students while other schools enroll the "poorest of the poor". This type of dual system fosters distinctions among schools based on social class (Kantor & Brenzel, 1992). Policy makers must address issues of adequacy with a clear understanding of the factors associated with student achievement. Major questions in the current debate are related to the identification of major factors associated with student achievement. For example, what is the role and relative importance of school variables (e.g., student-teacher ratio) and non-school variables (e.g., student socioeconomic status)? More specifically, in regard to financially related variables such as per-pupil expenditures, what is their level of prediction on student performance?

The educational reform movement has focused attention on the issue of funding equity, particularly in the state of Kentucky where the courts have mandated changes in funding formulas (Adams & White, 1997; Herbert, Busch, & Odden, 1994; Odden, 1993). In Kentucky,

the Kentucky Education Reform Act (KERA) was implemented in order to achieve greater equalization of per pupil revenues across the state (Goetz & Derbertin, 1992).

On March 29, 1990, the Kentucky General Assembly passed KERA, which mandated a complete restructuring of the Kentucky public elementary and secondary system in the areas of finance, governance, curriculum and assessment. Prior to the passage of KERA, equity of funding had been an important educational issue in Kentucky. Behind this movement was the belief that inadequate funding resulted in low levels of student learning; thus, pupils who lived in areas with fewer financial resources were thought to be deprived of an equal opportunity to learn (Rose v. Council for Better Education, 1989). Property assessment, local community tax effort, and teacher salaries were related to the funding issue (Wise, 1968). Kentucky's court mandated a uniform system of common schools throughout the state:

> Common schools free and available to all Kentucky children, should be uniform through out the state, should provide equal educational opportunities to all students regardless of those students' economic circumstances or places of residence, and should receive sufficient legislative funding to enable it to provide each Kentucky child an adequate education. (Jordan & Lyons, 1992, p. 78)

While funding was equalized in many school districts, the issue of educational "adequacy" remains. Student achievement is at the center of the discussion. The objective of adequacy is to identify and implement factors associated with high achievement, with a particular emphasis on supporting disadvantaged groups. The philosophy adopted is that equity and excellence are not principles mutually exclusive: all children, regardless of race, gender, socioeconomic status, or exceptionality, can learn at a proficient level given adequate support.

Historical Background on Educational Equity

In the 1954 case, Brown vs. Board of Education, the Supreme Court stated that segregated public elementary and secondary schools were inherently unequal and damaged the educational future of African American students. The need for equality of educational opportunity between minorities and Whites emerged as an essential public debate in American public education.

In 1964, a decade later, the Congress passed the "Civil Rights Act" which sought to ensure equal rights for all citizens, including equality of educational opportunity in our public schools. In conjunction with the Civil Rights Act, Congress provided funding which enabled James Coleman and his colleagues to conduct a study addressing equality of education. The goals of the project were to determine many educational issues, especially if equal educational opportunities were offered in schools. Research focused on the question of the relationship between school and non-school characteristics on student achievement (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & York, 1966).

The Coleman Report examined educational opportunity in terms of both input (equal resources to all students), process (school allocation and teaching-learning processes), and output (equal student achievement). The report examined the extent to which there was equality of investments in the education of different groups of students and the extent to which there was equality of academic results among groups as measured by performance on standardized achievement tests. Regarding educational inputs, the report looked at both school resources and home resources as measured by such variables as school expenditures and the education level of parents.

Coleman et al. (1966) concluded that, regarding achievement patterns, White and Asian students generally had much higher achievement test scores than students from other ethnic groups; also, these differences were associated in part with social class differences among the groups. The lower achieving groups had higher percentages of students from homes in which the parents had little formal education and low occupational levels. The Coleman Report showed that a significant factor related to student achievement was the family background of the students in terms of social class and race.

Supporting the Coleman findings was a study titled Inequality: A Reassessment of the Effect of Family and Schooling in America (Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, & Michelson, 1972). The research concluded that differences between schools can not be attributed only to economic inequality, since differences between schools seems to have very little effect on performance. Jencks and his colleagues challenged the debate by arguing that educational reform cannot bring about economic or social equality and that school quality has little effect on student achievement. The researchers contended that even if the schools could be reformed to ensure that every child received an equal education, adult society would hardly be more equal than it is at the present time. Jencks and his colleagues suggested that if American society strives to achieve greater equality, it must undertake more fundamental social and economic changes than reforming education financing.

School finance issues have also been presented in a legal context. The legal discussion has centered on determining the constitutionality of various state finance systems. One fundamental case, San Antonio Independent School District v. Rodriguez, provided the United States Supreme Court with an opportunity to address this issue in 1973. The US Supreme Court

stated in this case that the Fourteenth Amendment was not violated by the disparate allocation of state tax resources. As a result, recent rulings regarding school finance have been based more on provisions of state constitutions than by federal laws. Furthermore, since state constitutions have some degree of variation, it is common to find inconsistency in court decisions addressing educational equity (Koven, Shelley, & Swanson, 1998).

Kozol (1991) argues that denial of the means of competition is perhaps the single most consistent outcome of the education offered to poor children in the schools of our large cities. According to Kozol, one example of this inequality relates to school finances. Average expenditures per pupil is relatively high in some school districts and extremely low in others. In effect, a circular phenomenon evolves: "the richer districts -those in which property lots and houses are more highly valued- have more revenue, derived from taxing land and homes, to fund their public schools. The reputation of the schools, in turn, expands the tax base for their public schools." (p. 121). While funding inequalities in school prevail, some researchers have focused on the impact of non-school variables on academic performance.

Variables Affecting Student Achievement

Public pressure demanding higher levels of accountability has encouraged educational, psychological, and sociological researchers to explore factors that contributed to student performance. A research stream has focused on non-school variables. For example, numerous meta-analysis studies have been performed to investigate the relationship between socioeconomic status (SES) and academic achievement. Countless statistical tools such as T-tests, analysis of variances (ANOVA), chi-squares, and correlational coefficients have been used to analyze these relationships. Variables such as occupation of parents, education of parents, and income of

family have been traditionally used in the analyses. Variables such as home atmosphere have been operationalized in many ways, including parents' participation in cultural activities, reading materials at home, and family stability (White, 1982).

Another research stream has focused more on school and finance variables such as instructional expense per pupil, salary of teachers, and percent of teachers with master degrees. For example, Childs and Shakeshaft (1986) conducted a meta-analysis of research on the relationship between educational expenditures and student achievement. The researchers argued that findings are contradictory: studies that indicate no relationship, studies that indicate a positive relationship, and studies that indicate a positive relationship under specified conditions. The authors stated that, past a certain point, the amount of money a school district spends is not vital:

> There is considerable evidence that non-school factors are important determinants of educational outcomes. While school is one environmental factor influencing educational performance, so, too, are the home, press, radio, television, and other cultural elements. Then, too, the outcome of schooling is affected by native ability. (p. 262).

Gordon (1986) conducted a study to investigate the effect of expenditures on student achievement. Total per pupil expenditures, local per pupil expenditures and pupil performance on the Georgia Basic Skills Test were assessed. The researcher detected a significant correlation between per-pupil expenditures and reading performance at the high school level. Similar findings were found in a research conducted by Picone (1993). The researcher investigated the relationship between direct instructional expenditures and student performance on the California Achievement Test. The investigation was centered on student performance and direct

instructional expenditures in grades 4, 8, and 10 in the state of New Hampshire. The study revealed some differences in achievement levels on the basis of instructional expenditures. MacPhail-Wilcox and King (1995) concluded that class size and pupil teacher ratios were related to student achievement in 24 of 29 of the early production studies.

Other studies, however, found no relationship between per pupil expenditures and student achievement. In line with Coleman's classic study, Rossimiller (1980), reported that variables such as levels of spending per pupil, quality of buildings, and average class size do not appear to be closely related to student learning outcomes. Childs (1985) also found no significant relationship between expenditures and performance. When variables other that school expenditures were considered significant differences in achievement were observed. Russel (1990), and Orfield (1994) discovered disparate levels of achievement between schools of different racial composition (i.e., the gap between predominately white schools and predominately black schools). Lippman, Burns, and McArthur (1996) also provided evidence that there existed differences in achievement between schools of different social composition (i.e., high socio-economic status schools and low socio-economic status schools).

Hanushek (1997) conducted a meta-analysis to assess the effects of school resources on student performance. Approximately 400 studies were analyzed and the author concluded that fiscal policies held little hope for improving student achievement. The researcher stated that there is not a strong or consistent relationship between student performance and school resources, after variations in family inputs were taken in consideration. According to this author, there is no strong evidence of systematic relationships between school variables (e.g., teacher-student ratios, teacher education, or teacher experience) and student performance. A safe conclusion, based on



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the literature review is that, non-school factors matter as much or more than the actual physical, human or financial resources.

Research Questions

The paper will address research questions that arise from the review of literature and the particular context of the state and county's elementary school system. The purpose of this paper is to examine the association between school variables and non-school variables on student achievement. In the present study, data were analyzed to answer the following research questions:

1. What socio-economic, fiscal, and student achievement levels characterize the county?

2. What variables best predict student achievement, as defined by scores on the Comprehensive Test of Basic Skills (CTBS)?

3. What are the variables that best predict student performance in the specific subject areas of the CTBS, i.e., reading, language, and mathematics?

4. How does the school location (i.e., East, West, Southeast, or Southwest) differ on student achievement based on the CTBS scores?

5. How does the school location affects student achievement on the reading, language, and mathematics component of the CTBS?

It is hypothesized that the school factor, level of funding, is not as significant a predictor of academic performance as the socioeconomic factors. It is also hypothesized that geographical location of the school makes a difference in student achievement.

## Method

The unit of analysis consisted of all 88 elementary schools of the county in the state of

Kentucky under investigation.

Independent Variables and Data Collection

Multiple independent variables were included in the statistical analyses. A list of the independent variables and their definitions follow:

School Variables.

**Expenditure per pupil for instruction** was the amount of dollars spent for instructional purposes and on a per pupil basis, as reported in the county profile by schools during the 1998-1999 school year.

**Student teacher ratio** is the number of teachers divided by the number of student at each school, as reported in the county profile by schools during the 1998-1999 school year.

Non-school Variables.

**Percentage of students qualifying for free lunch** was the number of students who qualified for free or reduced lunches according to federal guidelines, as reported in the county profile by schools during the 1998-1999 school year. This variable operationalized socioeconomic status of the students.

**Percentage of black students** is an indicator of the racial makeup of the school, as reported in the county profile by schools during the 1998-1999 school year.

**Average household income of the area surroundings the school** is an indicator in terms of dollars reflecting the economic condition of where the school is located (based on the zip code). The Kentucky State Data Center provided this information.

**Geographic location of the school** is the location of the school also determined by the school's zip code. The county planning commission office was contacted to obtain this

information. The following areas of the county were defined: East, Southeast, Southwest, and West. See Appendix A for more details.

Dependent Variables and Data Collection

The fundamental dependent variable was the Comprehensive Test of Basic Skills (CTBS). This variable operationalized the construct of student achievement in terms of scores. The CTBS is a norm-referenced test designed to measure achievement in the basic skills. This test can assess cognitive processes such as recall, explicit information skills, inferential reasoning, and evaluation. CTBS also tests in three content areas: reading, language, and mathematics.

Normally, when investigating student performance, researchers have typically used results on nationally normed instruments such as the California Achievement Test (CAT), Scholastic Aptitude Test (SAT), and the American College Test (ACT). The performance of students on these tests has provided both educators and lay people with an indicator of the schools ability to prepare students academically. For example, for policymakers at the state level, the test results are seen as an important database of information about the status of education (Jaeger, 1991).

CTBS is a national standardized achievement test administered to all students in grades 3, 6 and 9. Reading, language and math tests were also administered. Scores are reported in Mean Normal Curve Equivalents (NCE). An NCE ranges from 1 to 99 with an average of 50. These scores compare the student's performance to a national norm group. NCE's are used in the county school's profile document because they can be averaged and compared over time.

Design and Procedures

The research design is quantitative in nature, specifically descriptive, correlational, and comparative. Descriptive statistics were performed. Multivariate multiple regression and multivariate analysis of variance (MANOVA) were utilized for assessing relationships and differences.

Stevens (1996) recommends the use of multiple regression when the researcher is interested in predicting a dependent variable from a set of predictors. Also, multivariate regression is recommended when the researcher is interested in predicting several dependent variables from a set of predictors. The researcher also recommends that the analysis of variance (ANOVA) can be used when more than two categories or groups of subjects are being compared on a dependent variable. However, if the groups or categories are compared on several dependent variables simultaneously, the multivariate analysis of variance (MANOVA) is the appropriate procedure.

Univariate and multivariate multiple regression analysis was conducted to assess potential predictors of student performance. Funding, defined as expenditure per pupil for instruction, was explored as one among other predictors of student performance. The other predictors included in the regression analyses were: socioeconomic status (i.e., percentage of students qualifying for free lunch), student teacher ratio, percentage of black students, and average household incomes of the area surrounding the school. Student performance was defined by the general CTBS scores and by the particular reading, language, and mathematics scores.

Univariate analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) were conducted to examine differences in student performance across school

location. The grouping variable was school location and the dependent variable was general score on the CTBS and also the specific scores on reading, language, and mathematics on the same test.

All data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 9.0. Analysis was performed using SPSS commands for multivariate regression, multiple regression, ANOVA, and MANOVA, following recommendations by Stevens (1996).

## Results

### Research Question 1: Descriptive Statistics of Variables

The first step was to compute descriptive statistics for fiscal, socio-economic, and educational performance indicators in the 88 schools of the county. Table 1 shows that average expenditures per pupil for instruction was $ 3,345 with a substantial percentage of students were in free and reduced meals program (M = 59). The student-teacher ratio was on average 18 students to 1 teacher, the percentage of Black students for the 88 schools was roughly one third, the household incomes surrounding the schools averaged less than $ 27,000 (M = $ 26,545), and the CTBS averaged 46. In particular, CTBS scores on language were the highest (M = 45.97), followed by scores on reading (M = 45.40), and scores on mathematics were the lowest (M = 44.85). All scores on specific subject areas of the CTBS had high variation: the reading component had the highest variability (SD = 9.29), followed by mathematics (SD = 8.41), and finally, the least was the language component of the test (SD = 7.98).

Table 1

Descriptive Statistics of Continuous Variables

| Variable | M | SD | N |
|---|---|---|---|
| Expenditure per pupil for instruction | $ 3,345 | 338.22 | 88 |
| Percentage of students qualifying for free lunch | 59.32 | 22.23 | 88 |
| Student teacher ratio | 17.73 | 2.63 | 88 |
| Percentage of black students | 33.44 | 11.19 | 88 |
| Average household income of area surrounding school | $ 26,545 | 9.56 | 88 |
| Comprehensive Test of Basic Skills (CTBS) | 45.47 | 8.92 | 88 |
| CTBS on Reading | 45.40 | 9.29 | 88 |
| CTBS on Language | 45.97 | 7.98 | 88 |
| CTBS on Mathematics | 44.85 | 8.41 | 88 |

The second step was to run frequencies and percentages on the categorical variable included in the study. Table 2 shows that geographic location of the schools was close to equal in terms of numbers of schools in each region of the county under investigation. The Southwest had a slightly higher percentage of schools (30 %), and the East had the lowest percentage of schools (22 %).



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Table 2

Frequencies and Percentages of Categorical Variables

| Variables | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| Location | | | |
| East | 19 | 21.6 | 21.6 |
| West | 23 | 26.1 | 47.7 |
| Southeast | 20 | 22.7 | 70.5 |
| Southwest | 26 | 29.5 | 100.0 |

Research Question 2: Predictors of Achievement on CTBS

The first task in the univariate regression was to analyze the correlation matrix for student achievement and the predictor variables to be used in the stepwise multiple regression procedure. As it can be seen in Table 3, all correlations were statistically significant at the .001 level, although differences were found in term of magnitude and direction (i.e., positive or negative). For instance, the CTBS scores were positively correlated to pupil per teacher ratio ($r = .602$) and average household income ($r = .453$), but negatively correlated to free/reduced lunch ($r = -.888$), percentage of Black students ($r = -.621$), and per pupil expenditures ($r = -.428$).

Table 3

Correlation Matrix for Student Achievement and Predictor Variables

| Variables | CTBS | Lunch | Black Student | Expenditures | Pupil-Teacher | Income |
|---|---|---|---|---|---|---|
| CTBS | 1.00 | -.888 | -.621 | -.428 | .602 | .453 |
| Lunch | | 1.00 | .688 | .481 | -.661 | -.634 |
| Black Student | | | 1.00 | .480 | -.544 | -.715 |
| Expenditures | | | | 1.00 | -.577 | -.332 |
| Pupil-Teacher | | | | | 1.00 | .406 |
| Income | | | | | | 1.00 |

Note: All variables were significant at the .001 level.

When variables were considered together in a stepwise multiple regression analysis, three of the independent variables contributed significantly to prediction of CTBS scores: percentage of students on free lunch, average household income, and percentage of black students; two variables, per pupil spending and the pupil teacher ratio, did not contribute significantly to the prediction model. Table 4 reports the R squared, or the proportion of variance in the dependent variable accounted for by its predictors. In predicting achievement (based on CTBS scores), 82% is accounted by using free lunch, household income and percentage of black students as predictors. The R square change tells us that the percentage of students on free lunch alone accounted for 79% of the CTBS scores. While still significant in terms of correlation, the



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household income (p=.003) and the percentage of black students (p=.038) only accounted for an additional 2% and 1% of the variability in CTBS scores.

Table 4

Stepwise Multiple Regression of Student Achievement on Predictor Variables

| Variables Entered | Beta | T | Change $R^2$ |
|---|---|---|---|
| Free/Reduced Lunch | -.945 | -14.18 | .789* |
| Household Income | -.257 | -3.71 | .020** |
| Percentage Black Students | -.154 | -2.09 | .009*** |

* F Change (1, 86) = 321.36, p = .000

** F Change (1, 85) = 9.11, p = .003

*** F Change (1, 84) = 4.39, p = .039

Adjusted $R^2$ = .819

Research Question 3: Predictors of Achievement on Subject Areas of the CTBS

A multivariate multiple regression was performed using percentage of students on free lunch, average household income, percentage of black students, per pupil spending and the pupil teacher ratio as independent variables. Dependent variables were the scores on reading, language, and mathematics of the CTBS. An overall significant difference was found on the dependent variables, Wilks' Lambda = 15.55, p = .000.

Regression analyses were performed to find the differences on each of the dependent variables. In the component of reading, 71 % of the variance was explained by one of the

independent variables, specifically the percentage of students on free lunch ($\underline{T}$ = -9.750, $\underline{p}$ = .000). Four variables, average household income, percentage of Black students, per pupil spending, and the pupil teacher ratio, did not contribute significantly to the prediction model.

In the component of language, 82 % of the proportion of variance in the dependent variable was accounted for two predictors, that is, the percentage of students on free lunch ($\underline{T}$ = -12.359, $\underline{p}$ = .000) and the average household income ($\underline{T}$ = -2.732, $\underline{p}$ = .008). Three variables, the percentage of Black students, the per-pupil spending, and the pupil-teacher ratio, did not contribute significantly to the prediction model.

In the component of mathematics, 78 % of the proportion of variance in the dependent variable was based on three predictors. The three predictors were the percentage of students on free lunch ($\underline{T}$ = -10.376, $\underline{p}$ = .000), the average household income level ($\underline{T}$ = -3.675, $\underline{p}$ = .000), and the percentage of Black students ($\underline{T}$ = -2.805, $\underline{p}$ = .006). Two variables, the per-pupil spending and the pupil teacher ratio, did not contribute significantly to the prediction model.

The multivariate regression analyses show that the percentage of students on free lunch is the most important predictor variables for reading, language, and mathematics; this variable was the strongest predictor on each of the three domains of the CTBS. Also, the analyses showed that the average household income is related to performance on language skills. Finally, the analyses showed that the average household income and the percentage of Black students are also related to one of the domains of the CTBS scores, that is, on the particular area of mathematics.

Table 5

Multivariate Regression of Predictors on CTBS Subject Areas

| Variables Entered | Beta | T |
|---|---|---|
| Reading | | |
| Free/Reduced Lunch | -.9503 | -9.750* |
| Language | | |
| Free/Reduced Lunch | -.9593 | -12.359* |
| Household Income | -.1941 | -2.732** |
| Mathematics | | |
| Free/Reduced Lunch | -.8882 | -10.376* |
| Household Income | -.2879 | -3.675* |
| Percentage Black Students | -.2411 | -2.805** |

*Significant at the .001 level

**Significant at the .05 level

Adjusted $R^2$ for reading = .6933

Adjusted $R^2$ for language = .8055

Adjusted $R^2$ for mathematics = .7635

Research Question 4: School Location and the Predictors of Achievement on the CTBS

The achievement scores, at the elementary level, are significantly greater in the East (M = 51.37), followed by the Southeast (M = 47.30), the Southwest (M = 43.35), and the West (M =

41.39) of the county under investigation. As it can be seen, based on descriptive statistics, the lowest CTBS scores come from elementary schools located in West region of the county.

An analysis of variance (ANOVA) was performed to find statistical significance on the dependent variable CTBS score with the grouping variable being location of the school, with four levels: East, Southeast, Southwest, and West. SPSS ANOVA was used for the analysis, after performing the procedures required for checking the assumptions (i.e., independence of observations, normality, and homogeneity of variance). Table 6 shows that CTBS, the dependent variable, was significantly affected by geographic location, ($F = 6.04$, $p = .001$).

Table 6

Analysis of Variance for Student Achievement by Geographic Location

| Source of Variation | df | SS | MS | F |
|---|---|---|---|---|
| Between Groups | 3 | 1,227.91 | 409.31 | 6.04* |
| Within Groups | 84 | 5,689.98 | 67.74 | |
| Total | 87 | 6,917.90 | | |

* $p = .001$

Post hoc procedures were utilized to find the specific group differences among the four groups. The Tukey Honestly Significant Difference Test showed that the elementary schools located in the East have a statistically significant difference on average CTBS scores when compared with the elementary schools located in the West and Southwest of the county at the .05

level (Mean Difference = 9.98 and 8.02, respectively). There was not found to be a significant difference between the achievement scores of schools located in the East and Southeast, the Southeast and the Southwest, and the Southwest and the West of the county.

Research Question 5: School Location and Predictors of Achievement on Subject Areas of the CTBS

The achievement scores on reading, language, and mathematics, at the elementary level, are significantly greater in the East ($\underline{M}$ = 50.64, $\underline{M}$ = 51.61, and $\underline{M}$ = 50.39, respectively). The reading, language, and mathematics scores of the East region of the county are followed by the Southeast ($\underline{M}$ = 46.00, $\underline{M}$ = 47.44, and $\underline{M}$ = 46.53, respectively), the Southwest ($\underline{M}$ = 43.80, $\underline{M}$ = 44.28, and $\underline{M}$= 42.88, respectively), and the West ($\underline{M}$ = 42.36, $\underline{M}$ = 41.93, and $\underline{M}$ = 41.02, respectively). As it can be seen, the lowest reading, language, and mathematics' CTBS scores come from elementary schools located in West region of the county.

A multivariate analysis of variance (MANOVA) was performed on the dependent variables for reading, language, and mathematics of the CTBS maintaining the grouping variable location of the school, with its four levels: East, Southeast, Southwest, and West. SPSS MANOVA was used for the analysis, after performing the procedures required for checking the assumptions (i.e., independence of observations, normality, and homogeneity of variance). It should be noted that the Box's Test of Equality of Covariance Matrices was statistically significant.

Table 7 shows that the dependent variables were significantly affected by geographic location, (Wilks' Lambda = 2.53, $\underline{p}$ = .009). When univariate analysis of variance (ANOVA) was performed on each of the dependent variables, it showed that reading, language, and mathematics



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are statistically significant affected by geographic location ($F = 3.38$, $p = .022$; $F = 6.90$, $p = .000$; and, $F = 5.94$, $p = .001$; respectively).

Table 7

Analysis of Variance for Student Achievement on Reading, Language, and Mathematics by Geographic Location

| Source of Variation | df | SS | MS | F |
|---|---|---|---|---|
| Reading | | | | |
| Between Groups | 3 | 807.66 | 269.22 | 3.38* |
| Within Groups | 84 | 6,699.30 | 79.75 | |
| Total | 87 | 7,506.97 | | |
| Language | | | | |
| Between Groups | 3 | 1,095.75 | 365.25 | 6.90** |
| Within Groups | 84 | 4,444.02 | 52.91 | |
| Total | 87 | 5,539.77 | | |
| Mathematics | | | | |
| Between Groups | 3 | 1,078.49 | 359.50 | 5.94** |
| Within Groups | 84 | 5,082.03 | 60.50 | |
| Total | 87 | 6,160.52 | | |

* $p < .05$
** $p < .01$

showed that average household income is correlated to language scores, and that both, household income and percentage of Black students is correlated to scores in mathematics.

The results of the ANOVA and MANOVA further support the hypothesis that educational achievement is largely based on geographical location and economical background of students. Schools located in regions with fewer financial resources (i.e., West and Southwest) have lower test scores than those with greater financial resources. The West and Southwest area of the county appears to require more attention in terms of improving student achievement. Particular strategies may address the specific needs of students who confront social and economical barriers to learning.

The findings from this study suggest that researchers and policy makers should focus attention on non-school variables in order to achieve equity and excellence. Educational equity as access to learning must go beyond the financial measures to a serious discussion of other issues. Merging the fields of urban affairs and education can be instrumental to this discussion.

As Kentucky enacts policies that promote equal distribution of resources and higher standards for all students, more attention needs to focus on student differences in terms of readiness and home resources available for learning. KERA calls for an adequate education for all children. KERA is characterized as a systematic reform, within which school finance is only one among many other components. The KERA has been based on the assumption that parent and family involvement are essential for the continuity and reinforcement that is necessary for success in school. The local community must provide services to support and complement the educational potential of families and schools to assist child learning (Wilson & Roeder, 1997).

Examples of programs aimed at addressing this need can be found. In Kentucky, programmatic reform efforts include social services and outreach programs for children coming from families in need. In particular, the Family Resource Centers have been designed to address the non-school variables. The Family Resource Centers strive to enable education, social services, and health care providers to reduce or eliminate the barriers to learning. Funded centers are to be located in or near each school in which 20 % or more of students are eligible for subsidized school meals.

According to Wilson and Roeder (1997), Family Resource Centers must address the following components: (a) assistance with full-time child care for children ages 2 and 3, (b) assistance with after-school child care for children ages 4-12, (c) health and education services to new and expectant parents, (d) support and training for child day care providers, (e) health services or referral to health services, (f) education to enhance parenting skills, and (g) education for preschool children and their parents.

The goal of such programs is to create a partnership that combines state educational objectives with the needs of private local companies, and assists communities in developing the human capital of the future. The involvement of the business community and neighborhoods are essential in any school reform effort. Businesses are interested in the availability of a skilled workforce that schools might provide. Neighborhoods and communities need to be revitalized with values and with the presence of more role models for future generations. The goal is to support education and economic development.

KERA represents a unique effort made by the state of Kentucky to improve the education of its citizens. However, even with the most capable leadership and all the best intentions of



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teachers, schools cannot by themselves resolve social problems that have an effect on student achievement in American schools (e.g., poverty, crime, and racial isolation). That is why it is so crucial to continue involving at every level other important actors of the educational process (i.e., parents, families, neighborhoods, communities, civil and business organizations).

Some research has confirmed positive impacts of strategies that include multiple actors. Comer (1980) led a systematic effort, the School Development Program (SDP), to improve schools with large numbers of disadvantaged students. The SDP placed a great deal of emphasis on strengthening linkages between educators and parents in elementary schools in New Haven, Connecticut that served a mostly disadvantaged African American student population. Only when a university, a public school system, and parents worked together was an acceptable level of academic achievement attained. Parents and staff were able to build a school community that not only resolved, but prevented learning barriers such as poor motivation, low self-steam, and discipline problems to impede performance.

Meier (1995) provides another excellent example of how teamwork and a rigorous curriculum can help disadvantaged and minority students. She noted the success of Central Park East Elementary School in East Harlem, New York, a small school of choice that offered a demanding curricular and instructional approach similar to those of many respected private schools. The school accepted the assumption that inner-city minority students could perform very well in a demanding environment if they are given the opportunity. The author argues that public education is vital to the future of American democracy and that good education is possible for all children.

Seeley (1985) provides another example of education through partnership. This conceptualization helps us understand the joint responsibilities of parents, teachers, students, and school systems. In today's society, the education of children cannot be treated as the exclusive responsibility of either parents or teachers. Learning relationships involve powerful interactions between families and schools and complex loyalties among the key partners, that is, students, teachers, and parents. "The crucial issue in successful learning is not home or school -teacher or student- but the relationship between them. Learning takes place where there is a productive learning relationship" (p.11).

Coleman (1988) and his concept of social capital in the creation of human capital is also relevant in this discussion. Social capital is about relations among actors that facilitate action. For example, a group that builds a relationship on trustworthiness is able to accomplish more than a comparable group with lower levels of trust. Applying the concept to schooling, Coleman argues that the effect of a lack of social capital within the family affects educational achievement. For example, the researcher showed that both social capital in the family and social capital in the adult community surrounding the school were valuable in reducing the high school drop out rate.

This study has shown the limits of educational reform if it only focuses on school variables: they explain only partially the issue of student achievement. The research confirms that non-school variables such as socioeconomic status plays a major role in education. Educational reforms that claim to be successful should continue focusing efforts on non-school variables that affect student achievement. Equity in funding is a useful but not sufficient mechanism for obtaining higher levels of student achievement.

This research should not be interpreted as suggesting that schools cannot reverse the effects of socioeconomic status on achievement of students. The research stream known as "school effectiveness" shows that intangible variables and school climate conditions can make a difference in student achievement even if students come from a lower socioeconomic status (Brookover, Beamer, Efthim, Hathaway, Lezotte, Miller, Passalacqua, & Tornatzky, 1982; Lezotte, Hathaway, Miller, Passalacqua, & Brookover, 1980; Meier, 1995; Walker, 1996).

Further research has to address school and non-school variables that affect student achievement, separately and combined. Moreover, the use of statistical techniques that use matching procedures or statistical controls for initial differences among the schools is recommended. Finally, in the case of Kentucky, it is highly recommended to continue expanding the research that analyzes the success of the Family Resource Centers.

References

Adams, J. E., & White, W. E. (1997). The equity consequence of school finance reform in Kentucky. Educational Evaluation and Policy Analysis, 19, 165-184.

Brookover, W., Beamer, L., Efthim, H., Hathaway, D., Lezotte, L., Miller, S., Passalacqua, J., & Tornatzky, L. (1982). Creating effective schools: An inservice program for enhancing school learning climate and achievement. Homes Beach, FL: Learning Publications.

Brown v. the Board of Education, 347 U.S. 483 (1954).

Childs, T., & Shakeshaft, C. (1986). A meta-analysis of research on the relationship between educational expenditures and student achievement. Journal of Education Finance, 12, 249-263.

Coleman, J. S. (1968). The concept of equality of educational opportunity. Harvard Educational Review, 38, 7-22.

Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94, S95-S120.

Coleman, J.S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. J., Weinfeld, F. D., & York, R. L. (1966). Equality of educational opportunity. Washington, DC: US Government Printing Office.

Comer, J. P. (1980). School power: Implications of an intervention project. New York: Free Press.

Goetz, S., & Derbertin, D. (1992). Rural areas and educational reform in Kentucky: An early assessment of revenue equalization. Journal of Education Finance, 18, 163-179.

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Gordon, N. B. J. (1986). Total per expenditures, local per pupil expenditures, and pupil performance on the Georgia Basic Skills Test. Dissertation Abstracts International, 47, (04), 1186.

Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: An update. Educational Evaluation and Policy Analysis, 19, 141-164.

Herbert, L., Busch, C., & Odden, A. (1994). School financing inequities among the states: The problem from a national perspective. Journal of Education Finance, 19, 231-255.

Jaeger, R. M. (1991). Legislative perspectives on statewide testing. Phi Delta Kappan, 73, 239-242.

Jencks, C., Smith, M., Acland, H., Bane, M. J., Cohen, D., Gintis, H., Heyns, B., & Michelson, S. (1972). Inequality: A reassessment of the effect of family and schooling in America. New York: Basic Books.

Jordan, K. F., & Lyons, T. S. (1992). Financing public education in an era of change. Bloomington, IN: Phi Delta Kappa Education Foundation.

Kantor, H., & Brenzel, B. (1992). Urban education and the "truly disadvantaged": The historical roots of the contemporary crisis, 1945-1990. Teachers College Record, 94, 278-314.

Koven, S. G., Shelley, M. C., & Swanson, B. E. (1998). American public policy: The contemporary agenda. Boston, MA: Hougnton-Mifflin.

Kozol, J. (1991). Savage inequalities: Children in America's schools. New York: Crown Publishers.

Lezotte, L., Hathaway, D., Miller, S., Passalacqua, J., & Brookover, W. (1980). School learning climate and student achievement: A social systems approach to increased student

learning. Tallahassee, FL: Michigan State University.

Lippman, L., Burns, S., & McArthur, E. (1996). Urban schools: The challenge of location and poverty. Washington DC: National Center for Educational Statistics. Report No. 96-864.

MacPhail-Wilcox, B., & King, R. A. (1995). Production function revisited in the context of educational reform. Journal of Education Finance, 12, 191-222.

Meier, D. (1995). The power of their ideas: Lessons for America from a small school in Harlem. Boston, MA: Beacon Press.

Odden, A. (1993). School finance reform in Kentucky, New Jersey, and Texas. Journal of Education Finance, 18, 293-317.

Orfield, G. (1994). The growth of segregation in American schools: Changing patterns of segregation and poverty since 1968. Equity and Excellence in Education, 27, 5-8.

Picone, J. L. (1993). An investigation of student performance and direct instructional expenditures in grades 4, 8, and 10 in the state of New Hampshire. Dissertation Abstract International, 54 (12), 4357.

Rose v. Council for Better Education, Inc., 790 S.W. 2nd 186: KY: 1989.

Rossimiller, R. A. (1983). Resource allocation and achievement: A classroom analysis. In A. Odden & L. D. Webb (Eds.), School finance and school improvement—Linkages for the 1980s (pp. 171-192). Cambridge, MA: Ballinger Publishing Company.

Russell, C. (1990). The carrot or the stick for school desegregation policy: Magnet schools or forced bussing. Philadelphia: Temple University Press.

San Antonio Independent School District v. Rodriguez, 411 U.S. 1 (1973).



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Seeley, D. S. (1985). Education through partnership: Mediating structures and education. Washington, DC: American Enterprise Institute for Public Policy Research.

Stevens, J. (1996). Applied multivariate statistics for the social sciences. Mahwah, NJ: Lawrence Erlbaum Associates.

Walker, V. S. (1996). Their highest potential: An African American school community in the segregated south. University of North Carolina Press.

White, K. R. (1982). The relationship between socioeconomic status and academic achievement. Psychological Bulletin, 91, 461-481.

Wilson, S. M., & Roeder, P. W. (1997). KERA Family Resource and Youth Services Centers. In J. C. Lindle, J. Petrosko, & R. Pankratz (Eds.), 1996: Review of research on the Kentucky Education Reform Act (KERA). Lexington, KY: The Kentucky Institute for Education Research.

Wise, A. (1968). Rich schools poor schools: The promise of equal educational opportunity. Chicago: The University of Chicago Press.

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